



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

Memorandum

Date **OCT 25 2001**

Reply to Attn. of:

Ref. No. 01-0247

Subject: **INFORMATION: Request for Clarification**

From: Delmer F. Billings 
Chief, Standards Development, DHM-11

To: William Quade
Chief, Hazardous Materials Division. MC-ECH

This is in response to your September 19, 2001 letter asking for a confirmation of the following questions and answers you provided concerning cargo tank regulations in the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Your questions are answered as follows:

- Q1. A specification MC-307 cargo tank has a design pressure of 25 psig. Is it permissible to replace the original pressure actuated vent with a 400 series pressure relief device that will limit tank pressure to 130% of design pressure (32.5 psig) as required by § 178.342-2(b), but will not open until 30 psig?
- A1. No, a self closing pressure relief device set above a cargo tank's design pressure would allow the unit to be operated above its designed pressure which is in violation of § 180.407(a)(2). For example an MC-307 cargo tank with a design pressure of 25 psig must have a pressure relief device which opens at 25 psig so to not allow the tank to continually operate over pressurized. The pressure relief device must be able to limit tank pressure to 130% of the design pressure.
- Q2. Section 173.33(b)(4) allows pressure in a cargo tank during loading/unloading of up to 130% of the MAWP of the cargo tank, but § 173.33(c)(1)(vi) states that the MAWP of the cargo tank cannot exceed the maximum pressure during loading or unloading. Do these two requirements conflict?
- A2. No. Section 173.33(b)(4) is only applicable in an accident situation. In the preamble to the HM-183 Final rule published on September 7, 1990 (55 FR 37092) relating to this question RSPA stated the following regarding § 173.33:

“Paragraph(c)(1)(vi) relates to pressure within a cargo tank during normal loading or unloading. In contrast, paragraph (b)(4) relates to the maximum surge pressure that may be applied to the tank as a result of an overfill or over pressurization during a loading or unloading accident. There is no inconsistency between these requirements . . .”

In addition, § 180.407(a) prohibits operating a cargo tank at a pressure greater than its design pressure/MAWP.

Q3. According to § 173.33(d)(3) the pressure relief system on a 300 series cargo tank may be upgraded to a pressure relief system meeting the requirements of a 400 series cargo tank, as long as “the venting capacity requirements of the original specification are met when a pressure relief valve is modified.” However, the methods for determining venting capacity are different for the 300 series and 400 series cargo tanks. According to § 178.345-10(g) the 400 series pressure relief devices are to be flow rated at a pressure not to exceed the test pressure for the cargo tank. DOT-407 vents are typically tested and rated at 1.5 times MAWP. The MC-307 specification (§ 178.342-4) requires the devices to be tested at 130%. For a 300 series cargo tank that is equipped with a pressure relief device manufactured in accordance with 400 series requirements, at what pressure should the flow capacity be determined?

A3. The flow capacity must be determined using the requirements of the original specification, as stated in § 173.33(d)(3). Therefore, in the example you included above, the DOT-407 vent used on an MC-307 cargo tank must be flow tested at 130% of the design pressure to accurately determine compliance with the minimum venting requirements of § 178.340-4. This information should be supplied by the manufacturer of the pressure relief device.

#

Date: 09/19/2001 07:22 am -0400 (Wednesday)
From: Theodore Turner
To: Shelton, Daniel
Subject: Re: Fwd: FW: Request for Interpretation

Johnsen
123-33
180-407

Cargo Tanks
01-0247

Yes a signed one is best. The next step will be to notify the venting manufacturers that they need to "inform" their customers of the flow rates of 400 series vents installed on 300 series cargo tanks. There is a significant difference especially for a 25 psig design pressure tank, since you will need two vents to get the required capacity instead of the one device now used. I have a table of flow rates for Fort Vale. I have not yet gotten the Girard information. Thanks Ted

theodore.turner@fhwa.dot.gov

>>> Daniel Shelton 09/18/01 11:37AM >>>

Here is the response to your e-mail request concerning venting questions. If you need a signed interpretation please let me know.

WANTS INTERP FOR ATTACHED QUESTIONS.

ADDRESS

~~THEODORE TURNER~~

DANIEL SHELTON

Q. A specification MC-307 cargo tank has a design pressure of 25 psig. Is it permissible to replace the original pressure actuate vent with a 400 series pressure relief device that will limit tank pressure to 130% of design pressure (32.5 psig) as required by 178.342-2(b), but will not open until 30 psig?

A. No, a self closing pressure relief device set above a cargo tanks design pressure would allow the unit to be operated above the units designed pressure in violation of 180.407(a)(2). For example an MC-307 cargo tank with a design pressure of 25 psig must have a pressure relief device which opens at 25 psig so to not allow the tank to continually operate down the road over pressured. The pressure relief device must be able to limit tank pressure to 130% of the design pressure.

Q. 173.33(b)(4) allows pressure in a cargo tank during loading/unloading up to 130% of the MAWP of the cargo tank, but 173.33(c)(1)(vi) states that the MAWP of the cargo tank cannot exceed the maximum pressure during loading or unloading. Do these two sections conflict?

A. No. 173.33(b)(4) is only applicable in an accident situation. In the preamble to the HM-183 Final rule published on September 7, 1990 (55 FR 37092) relating to this question RSPA stated the following regarding 49 CFR 173.33:

“Paragraph(c)(1)(vi) relates to pressure within a cargo tank during normal loading or unloading. In contrast, paragraph (b)(4) relates to the maximum surge pressure that may be applied to the tank as a result of an overfill or over pressurization during a loading or unloading accident. There is no inconsistency between these requirements . . .”

In addition, 180.407(a) prohibits operating a cargo tank at a pressure greater than its design pressure/MAWP.

Q. According to 173.33(d)(3) the pressure relief system on a 300 series cargo tank may be upgraded to a pressure relief system meeting the requirements of a 400 series cargo tank, as long as “the venting capacity requirements of the original specification are met when a pressure relief valve is modified.” However, the methods for determining venting capacity are different for the 300 series and 400 series cargo tanks. According to 178.345-10(g) the 400 series pressure relief devices are to be flow rated at a pressure not to exceed the test pressure for the cargo tank. DOT-407 vents are typically tested and rated at 1.5 times MAWP. The MC-307 specification (178.342-4) requires the devices to be tested at 130%. For a 300 series cargo tank that is equipped with a pressure relief device manufactured in accordance with 400 series requirements, at what pressure should the flow capacity be determined?

A. The flow capacity must be determined using the requirements of the original specification, as stated in 173.33(d)(3). Therefore in the example you included above, the DOT-407 vent used on an MC-307 vent must be flow tested at 130% of the design pressure to accurately determine compliance with the minimum venting requirements of 178.340-4. This information should be supplied by the manufacturer of the pressure relief device.